

CENTRAL AND EAST EUROPEAN NON-EURO ZONE CAPITAL MARKETS: ARE THEY WORTH THE RISK?

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Abstract

The paper examines if the marginal contribution of some East and Central European countries that are not part of the Euro zone, but are part of the EU, to an efficient portfolio with developed country indexes, leads to a significant improvement in the performance of international portfolio of financial assets. The Central and East European countries included in our research are: Romania, Croatia, Hungary, Czech Republic and Poland. Our analysis is conducted solely from the perspective of an euro-zone investor. The research methodology consists of a standard mean-variance approach in computing the efficient portfolios. We start by a 2-asset portfolio formed out of developed countries indexes and then add a Central or East-European country index and observe the performance of a 3-asset efficient portfolio at different risk levels. We associate the portfolio risk levels with investors risk tolerance and draw conclusions on the real business cycle facilitates bilateral flows from Euro zone to Central and East-European countries. We argue that a main determinant of the bilateral portfolio flows between euro zone block of countries and the Central and East-European countries should be the marginal international diversification benefit, reflected in increased performance, from adding one of those capital market indexes to a diversified portfolio of developed countries.

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1. Introduction

The idea of international investing suggests that an investor can obtain more efficient diversification of its holdings if it includes in the portfolio foreign financial assets and consequently, this should increase the performance of every international portfolio and will finally lead to increased efficiency of the international capital stock. Although the benefits of international investing are evident and in the last decades we see a continuous surge in international capital flows, evidence shows that global investing also implies a lot of additional uncertainties for both the individual institutional investors and the emerging economies that pursued liberalization of capital flows policies in order to foster real domestic economic growth. Besides this, the process of domestic financial markets integration leads to increases in correlation between capital markets and to more dangerous outcomes like contagion and systemic risk.

In this context, the objective of the paper is to analyze to what extent emerging markets can still improve the performance of international portfolio. Therefore, we concentrate on Central and East-European capital markets (CEEM) that are part of the European Union (EU) but not part to EU monetary union – Euro zone and see if they can improve the performance of an international portfolio from the perspective of an Euro zone investor. This research is very important for CEEM countries as a great deal of Euro zone capital flows to can be explained using this approach and consequently public policies that aim at maintaining financial stability and promote economic growth should take into account the time-varying efficient investment opportunities from the perspective of an European capital market.

In order to answer the research question in a robust way we proceed with the well-known mean-variance efficient portfolio analysis and a comparative analysis. We select 5 Central and East-European markets (Romania, Hungary, Bulgaria, Croatia and Czech Republic) and investigate their individual marginal contribution to a two-asset efficient portfolio composed of USA capital market, and Euro zone capital market. Afterwards, we include sample CEEM in an equal-weighted index and investigate to what extent the performance of the index is relevant for an Euro zone investor.

2. Literature review

International investing is a central theme in the theory of finance for more than two decades, both academics and practitioners emphasizing the

benefits and risks of international financial markets. Research in international investing was spurred mainly by an increase openness of emerging economies and a general acknowledgment that global capital markets increase the efficiency in the allocation of world capital stock and lead to a generalized increase in economic wealth. A complete literature review of papers that address similar topics to the one discussed here would be practically impossible, therefore this section will include only some of the most relevant research papers.

Conover, Jensen and Johnson (2002) show, from the perspective of the American investor, that in expansionary monetary policy eras the benefits of holding emerging markets financial assets is greatly reduced, as compared to restrictive monetary policy eras. The researchers use a standard methodology, similar to the one presented here, 24 years of data and 20 developing countries capital market indexes. Another important result is that although taken individually emerging markets do not have a significant contribution to a portfolio formed only from developed countries, but when included in a GDP weighted index of emerging countries the potential contribution to an efficient portfolio dramatically increases and the American investor can obtain better expected risk-expected return payoffs, as the efficient frontier is moved to the left.

Obstfeld and Taylor (2004) propose a historical quantitative and qualitative approach on global capital markets and identify not only the benefits, but also emphasize the dangers domestic economies are exposed to when they promote public policies that lead to a more complete integration of domestic market in the global capital market. They propose a more theoretical framework and are focused on implications for public policies, not on the purely international portfolio management implications of global capital markets.

Bekaert and Harvey (1995, 1997, 2002, 2003) wrote a series of articles which address some additional issues associated with international investing, like contagion risk and integration of domestic financial markets in a global market.

The researchers also study the benefits of investing in emerging countries and address the issue of volatility on emerging markets from an international perspective (1997), using an autoregressive volatility model (ARCH) with a world explanatory factor depending if we move from a segmented to an integrated emerging capital market. They identify some

stylized facts of emerging markets financial asset returns: like non-normal returns distribution (high skewness and kurtosis), higher average returns than developed countries, higher volatility, low correlations with developed markets. Using a variance decomposition technique, the researchers find that in an integrated emerging capital market the world factors explain a large amount of the local variance, while in segmented markets the local factor is the most important. Another paper conclusion is that emerging markets capital market liberalization significantly decreased volatility and implicitly the cost of capital.

Bekaert and Harvey (2003) investigate the effects of financial markets integration and liberalization on post real economic growth, correlation with developed countries and bilateral portfolio and direct capital flows from developed countries to emerging markets. The researchers argue that integration leads to a reduction in the cost of capital and consequently promotes economic growth. They also advance a really important idea, saying that market integration can spur contagion crises which are easily transformed in financial crises and argue that in those periods, affected countries should limit capital flows.

Hourvoulides (2009) analyzes the short and long term relationships among matured and emerging European stock markets: Euronext, Germany and Greece as matured and Bulgaria, Cyprus, Romania, Slovenia and Turkey as emerging. The research uses 8 years of data, from 2000 to 2008, showing that European markets are cointegrated (there exists a long-term stable relationship between them) but the return distributions for each of the markets included in the analysis experience important differences.

Forbes and Rigobon (2002) write a classic paper on international portfolio risks, analyzing a crucial difference between interdependence, a constant strong correlation between markets, and contagion, which refers to a significant increase in the correlation between markets, with heteroskedasticity robust tests for correlation coefficients.

3. Data and methodology

We included in our research capital market indexes from 5 East and Central-European economies: Romania (BETC Composite Index), Poland (Thomson-Reuters Poland Index), Czech Republic (Thomson-Reuters Czech Republic Index), Hungary (Thomson Reuters Hungary Index) and Croatia (CROBEX Index). For Euro zone we considered FTSE Eurofirst 300

Eurozone Index and for USA capital market return we considered S&P500 index. All data, including spot exchange rates for transforming domestic currency returns in euro returns, is collected from the Thomson-Reuters database with a monthly frequency, first month in our sample is May 1999 and last month is June 2014, counting 182 observations for each time-series.

4. Summary statistics

After converting all the monthly returns in Euro, we computed the main descriptive statistics for each time-series included in our sample, the expected return, computed as mean return over sample period, standard deviation, skewness, kurtosis and the coefficient of variation, as monthly standard deviation divided by expected return. The data for our sample is reported in Table 1, in parenthesis you can find the annualized figures:

Table 1: Descriptive Statistics for Stock Returns in Euro

Index	Expected return	Standard deviation	Skewness	Kurtosis	Coefficient of variation
Euro zone	-0.01% (-0.13%)	5.5% (18.90%)	-0.72	4.36	-
USA	0.07% (0.87%)	4.6% (15.88%)	-0.47	3.06	63.81
Romania	0.56% (6.89%)	9.6% (33.36%)	-0.77	5.58	17.3
Poland	0.82% (10.28%)	8.4% (29.03%)	0.08	3.93	10.24
Czech Republic	0.90% (11.41%)	7.0% (24.22%)	-0.39	4.55	7.73
Hungary	0.43% (5.33%)	8.7% (30.17%)	-1.04	6.94	20.09
Croatia	0.51% (6.28%)	7.6% (26.28%)	-0.59	7.47	14.91
CEEM	0.64% (8.01%)	6.77% (23.44%)	-1.23	6.87	10.5

The reader can notice some stylized facts of emerging countries returns as compared to the developed countries. For example, we can find higher average returns for emerging markets (CEEM countries) compared to USA and Euro zone indexes at the cost of higher volatility. Also, notice that

the kurtosis (which indicates fatter tails of the return distribution) is generally higher (the only exception is Poland) for CEEM countries.

Please find below, in Table 2, the Pearson correlation coefficients for the indexes included in our research:

Table 2 : Pearson correlation coefficients for monthly country index returns in Euro

	Euro zone	USA	Romania	Poland	Czech Republic	Hungary	Croatia	CEEM
Euro zone	1.00	0.74	0.43	0.69	0.54	0.63	0.47	0.67
USA		1.00	0.27	0.52	0.36	0.42	0.37	0.47
Romania			1.00	0.56	0.60	0.64	0.47	0.82
Poland				1.00	0.64	0.76	0.49	0.84
Czech Republic					1.00	0.73	0.43	0.82
Hungary						1.00	0.53	0.90
Croatia							1.00	0.70
CEEM								1.00

Notice from the above table that the correlations between CEEM country indexes and developed economies, Euro zone and USA, tend to be lower than the correlation between developed economies. On average CEEM countries show a correlation coefficient of 0.67 with Euro zone index and 0.47 with USA index, indicating potential significant diversification benefits from the perspective of an euro-zone investor.

5. Efficient portfolios

We compute a series of mean-variance efficient portfolios using a 3-asset approach, Euro zone, USA and each CEEM country, and compare it to the 2-asset efficient portfolio frontier of developed countries portfolios. We also imply different levels of risk for the portfolios and present the results in a structured table. The portfolio weights are restricted as positive (the investor cannot short sell any index) because we want to see to what extent holding an CEEM index can lead to improved diversification benefits and more importantly to what extent this can explain bilateral capital flows between Euro zone countries and CEEM countries in our sample. We consider that the

marginal contribution of a CEEM country to a diversified portfolio should be the main determinant behind the bilateral capital portfolio and direct flows.

Please find below a table which contains mean-variance efficient portfolios at different risk levels composed only with Euro-zone and USA indexes:

Table 3 : Efficient portfolio at different risk levels (Euro zone and USA indexes)

Euro zone weight	USA weight	Implied σ (rp)	E (rp)
-	-	4.50%	N/A
62%	38%	4.80%	0.02%
76%	24%	5.00%	0.01%
88%	12%	5.20%	0.00%
98%	2%	5.40%	-0.01%
100%	-	5.50%	-0.01%
-	-	5.80%	N/A

Our next objective is to include each CEEM country and an equally weighted index composed out of CEEM countries in the analysis in order to see to what extent the performance of efficient portfolios at different risk levels is improved and secondly, to what extent a more complete combination of risk-expected return portfolios is available.

Table 4 – Expected return of efficient portfolios with CEEM countries indexes included (3-asset portfolio) at various implied risk levels

Portfolio	Implied σ (rp)	E (rp) 2-asset	E (rp) Romania	E (rp) Poland	E (rp) Czech Rep	E (rp) Hungary	E (rp) Croatia	E (rp) CEEM
1	4.00%	N/A	N/A	N/A	N/A	N/A	N/A	N/A
2	4.20%	N/A	N/A	N/A	N/A	N/A	N/A	N/A
3	4.50%	0.01%	0.14%	0.06%	0.10%	N/A	0.16%	0.15%
4	4.70%	0.03%	0.19%	0.17%	0.26%	0.06%	0.20%	0.20%
5	4.90%	0.01%	0.21%	0.23%	0.28%	0.04%	0.23%	0.27%
6	5.10%	0%	0.24%	0.27%	0.33%	0.04%	0.25%	0.32%
7	5.30%	0%	0.26%	0.31%	0.45%	0.03%	0.27%	0.37%

8	5.50%	N/A	0.27%	0.35%	0.53%	0.04%	0.28%	0.28%
9	5.70%	N/A	0.29%	0.38%	0.60%	0.10%	0.30%	0.37%
10	6.00%	N/A	0.31%	0.44%	0.69%	0.16%	0.32%	0.46%
11	6.50%	N/A	0.35%	0.52%	0.81%	0.22%	0.36%	0.59%

As one can notice from Table 4, the 3 assets portfolios, which include besides USA and Euro zone indexes, one of the CEEM countries indexes, have a much more improved performance, as compared to the 2-asset developed countries portfolio. More than that, as the European investor becomes more tolerant to risk, he can compose portfolios at levels of risk that were not available if the investment opportunity set included only USA and Euro zone.

6. Conclusions

Our research objective was to find to what extent the emerging Central and East-European economies improve the performance of international portfolios of financial assets from developed countries, by analyzing the perspective of an euro zone investor. We focused on the period 1999-2014, covering 14 years of the most recent data available with monthly frequency, and constructed mean-variance efficient portfolios including 2 assets (USA and Euro zone) as proxies for developed countries investment opportunity set and 3-asset portfolios in order to investigate the marginal contribution of CEEM countries indexes to an efficient portfolio of developed countries. Our results show that, during the period analyzed, international diversification with Central and East-European economies from the perspective of an euro zone investor produced significant improvements in the portfolio performance, (1) producing considerably higher expected returns for the same level of expected risk and (2) allowing euro zone investors to create more risky portfolios, improving significantly the allocation of domestic resources.

From the perspective of public policies, we observe that when the risk tolerance is higher (meaning the risk aversion is lower), during expansionary business real cycles for example, the bilateral portfolio flows between Euro zone and emerging non-Euro zone countries (CEEM countries) should increase as the Euro-zone investors can achieve disproportionately high returns for a proportionate higher level of expected risk. Because we do not see this disproportionate effect on the portfolios with lower risk, there is incentive for sudden withdrawals of capital from emerging CEEM countries

by Euro zone investors, as the general volatility is lower in developed capital markets. Public policies in CEEM countries should take this into account as it can affect the financial stability, induce large depreciation of national CEEM currencies and decrease real output.

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